REMARKS

In view of the following discussion, the Applicants submit that none of the claims now pending in the application is made obvious under the provisions of 35 U.S.C. § 103. Thus, the Applicants believe that all of these claims are now in allowable form.

In addition, the Applicants' representative would like to thank Examiner Rekstad for kindly taking a substantial amount of time on July 21, 2005 to discuss the merits of the subject invention. The Applicants' representative is aware of the time constraint that is placed on the Examiner and is appreciative of the Examiner's willingness to devote such large quantity of time to discuss the case on the merits.

I. REJECTION OF CLAIMS 1-9, 11, 14, 15, 25-28, 32-38, 40 AND 43-45 UNDER 35 U.S.C. § 103

A. Claims 1-7, 11, 14, 15, 25 and 26

The Examiner has rejected claims 1-7, 11, 14, 15, 25 and 26 under 35 U.S.C. §103(a) as made obvious by the Suzuki patent (US patent 6,567,427, issued on May 20, 2003, hereinafter "Suzuki"). In response, the Applicants have amended independent claims 1 and 25, from which claims 2-7, 11, 14, 15 and 26 depend, to more clearly recite aspects of the present invention.

Suzuki teaches image signal multiplexing and demultiplexing apparatuses. The multiplexing apparatus is adapted for multiplexing image signals for transmission through a transmission medium by selecting spatial configuration information for describing a predetermined object and then selecting bitstreams constituting the predetermined object from among a plurality of layers of bitstreams having different qualities. The selected spatial configuration information and the selected bitstreams are then multiplexed with additional information and output to the transmission medium, *e.g.*, as a single bitstream. The demultiplexing apparatus receives the single bitstream and separates the single bitstream into the spatial configuration information, the plurality of layers of bitstreams and the additional information and processes this separated

information in order to reconstruct the original image signal.

The Examiner's attention is directed to the fact that Suzuki fails to disclose or suggest the novel invention of encoding each component of a video image sequence in accordance with a plurality of dimensions to form a plurality of bitstreams, such that the plurality of bitstreams forms a partial order having a common bitstream as its base, as claimed in Applicants' amended independent claims 1 and 25. Specifically, Applicants' claims 1 and 25, as amended, positively recite:

> 1. A method of deconstructing video comprising:
> separating a video image sequence into two or more components;
> selecting a plurality of dimensions, where each dimension represents a characteristic of the video image sequence; and
> encoding each component of the video image sequence in accordance with the selected dimensions to form a plurality of bitstreams, such that the plurality of bitstreams forms a partial order wherein each point of the partial order represents a unique valid combination of components and dimensions for encoding the video image sequence, and a base of the partial order represents a base bitstream comprising components that are common to each of said plurality of bitstreams. (Emphasis added)

> 25. Apparatus for producing deconstructed video comprising:
> a video component extractor for extracting at least one second image sequence from a first image sequence, where said at least one second image sequence represents a component of said first video image sequence;
> an encoding dimension selector for selecting a plurality of dimensions to use to encode said at least one second image sequence; and
> a dimension-based encoder, coupled to said encoding dimension selector, for encoding the at least one second video image sequence into a plurality of bitstreams, such that the plurality of bitstreams forms a partial order wherein each point of the partial order represents a unique valid combination of dimensions for encoding the first image sequence and the at least one second image sequence, and a base of the partial order represents a base bitstream comprising components that are common to each of said plurality of bitstreams. (Emphasis added)

Applicants' invention is directed to a method and apparatus for generating, distributing and reconstructing deconstructed video over a network. In contrast, conventional systems that distribute deconstructed video through communications

PAGE 14/23 * RCVD AT 7/25/2005 8:04:17 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/26 * DNIS:2738300 * CSID:732 530 9808 * DURATION (mm-ss):08-12

networks often encode video sequences into several independent data streams, wherein each data stream represents an entire video sequence having a different level of image quality. An end user or decoder device then selects one appropriate data stream to match user equipment capabilities. Such methods typically require a priori user familiarity with device capabilities in order to manually select the appropriate data stream. Moreover, the transmission of multiple data streams containing full representations of video sequences consumes a tremendous amount of bandwidth and storage space.

The present invention provides a method for encoding video sequences in which a video sequence is divided into two or more constituent components (*e.g.*, foreground/background, moving objects/stationary objects, text/versus moving video, face/remaining video, fixed regions/other regions, infrared geometric shapes/other regions, annotated regions/other regions, graphics/non-graphics, etc.). The components of the video sequence are then deconstructed into multiple dimensions (*e.g.*, resolution, frame rate, display type, etc) by generating a partial order representation of the deconstructed elements for each component of the video. The method thereby produces a common base bitstream calculated from common components of the individual dimensional base bitstreams (and forming the base of the partial order), plus a plurality of separately encoded additional or augmentation bitstreams, which collectively form the partial order/lattice structure. Intersection points of the bitstreams represent "improved" video sequences including combinations of the base bitstream with one or more of the augmentation bitstreams. Thus, by performing multidimensional video deconstruction, any two or more subsets of bitstreams may be combined to produce an optimal video sequence for a particular user device.

In contrast, Suzuki does not teach any structure for relating or choosing bitstreams in order to deconstruct or reconstruct a video image sequence. Particularly, Suzuki does not teach that a plurality of bitstreams representing different dimensions with which components of a video image signal are encoded can be arranged in a partial order (*e.g.*, a lattice) having a common bitstream (*e.g.*, comprising components common to all of the plurality of bitstreams) as its base.

PAGE 15/23 * RCVD AT 7/25/2005 8:04:17 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/26 * DNIS:2738300 * CSID:732 530 9808 * DURATION (mm-ss):08-12

The Applicants' invention positively claims the step of encoding each component of a video image sequence in accordance with a plurality of selected dimensions to form a plurality of bitstreams, such that the plurality of bitstreams forms a partial order wherein each point of the partial order represents a unique valid combination of components and dimensions for encoding the video image sequence, and a base of the partial order represents a base bitstream comprising components that are common to each of the plurality of bitstreams. This allows, for example, a user device to select different dimensions and different corresponding dimensional qualities for each deconstructed component of the original video image sequence (*e.g.*, by selecting a given point in the partial order), such that the reconstructed video image sequence comprises the best quality video image sequence that may be processed by the user device in accordance with the user's preferences (*e.g.*, the background may be deconstructed according to frame rate, and the foreground may be deconstructed according to resolution and so on). Suzuki's system is completely devoid of any teaching relating to the need or desire to encode each component of a video sequence into a plurality of deconstructed bitstreams such that the plurality of bitstreams forms a partial order having a common bitstream as its base.

The Examiner submits in the Office Action that Suzuki does, in fact teach this limitation. However, the portions of Suzuki that the Examiner cites to support this limitation teach, at most, that a scalable encoding method may provide several levels of increasingly improved-quality images in accordance with any one of a plurality of different potential dimensions (*e.g.*, spatial scalability, temporal scalability or signal-to-noise ratio scalability). The cited portions of Suzuki do not teach, show or suggest any structure for ordering such improvements, and certainly do not teach that improvements may be arranged in a partial order.

Therefore, the Applicants submit that, at least for the reasons presented above, independent claims 1 and 25, as amended, fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder.

Dependent claims 2-7, 11, 14, 15 and 26 depend from claims 1 and 25, and recite additional features therefore. As such, and for at least the same reasons set forth

PAGE 16/23 * RCVD AT 7/25/2005 8:04:17 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/26 * DNIS:2738300 * CSID:732 530 9808 * DURATION (mm-ss):08-12

above, the Applicants submit that claims 2-7, 11, 14, 15 and 26 are not made obvious by the teachings of Suzuki. Therefore, the Applicants submit that dependent claims 2-7, 11, 14, 15 and 26 also fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder.

B. Claims 8 and 9

The Examiner has rejected claims 8 and 9 under 35 U.S.C. §103(a) as made obvious by Suzuki in view of the Chaddha patent (U.S. Patent No. 5,621,660, issued April 15, 1997, hereinafter "Chaddha"). In response, the Applicants have amended independent claim 1, from which claims 8 and 9 depend, as discussed above to more clearly recite aspects of the invention.

Suzuki has been discussed above.

Chaddha teaches a video delivery system that provides end-to-end encoding such that a single embedded data stream is produced containing several video sequence layers. In particular, Chaddha teaches that an original video sequence is encoded into a data stream comprising a first or "base" layer containing a video sequence of a lowest resolution, and two "enhancement" layers containing enhancement data that, when combined with the base layer video, display increasingly higher-resolution video sequences. A decoder may then extract one or more of the video sequence layers to display, in accordance with the decoder's own operating parameters. However, Chaddha, like Suzuki, does not teach that a plurality of bitstreams representing different dimensions with which components of a video image signal are encoded can be arranged in a partial order (*e.g.*, a lattice) having a common bitstream (*e.g.*, comprising components common to all of the plurality of bitstreams) as its base.

The Examiner's attention is directed to the fact that Chaddha, like Suzuki, fails to disclose or suggest the novel invention of encoding each component of a video image sequence in accordance with a plurality of dimensions to form a plurality of bitstreams, such that the plurality of bitstreams forms a partial order having a common bitstream as its base, as claimed in Applicants' amended independent claim 1, which has been

PAGE 17/23 * RCVD AT 7/25/2005 8:04:17 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/26 * DNIS:2738300 * CSID:732 530 9808 * DURATION (mm-ss):08-12

recited above.

As discussed above, the Applicants' invention provides a method for encoding video sequences in which a video sequence is divided into two or more constituent components which are then deconstructed into multiple dimensions by generating a partial order representation of the deconstructed elements for each component of the video. The method thereby produces a common base bitstream calculated from common components of the individual dimensional base bitstreams, plus a plurality of additional or augmentation bitstreams. By performing multidimensional video deconstruction, any two or more subsets of bitstreams may be combined to produce an optimal video sequence for a particular user device.

In contrast, neither Suzuki nor Chaddha teaches any structure for relating or choosing bitstreams in order to deconstruct or reconstruct a video image sequence. The Applicants' invention positively claims the step of encoding each component of a video image sequence in accordance with a plurality of selected dimensions to form a plurality of bitstreams, such that the plurality of bitstreams forms a partial order wherein each point of the partial order represents a unique valid combination of components and dimensions for encoding the video image sequence, and a base of the partial order represents a base bitstream comprising components that are common to each of the plurality of bitstreams. Both Suzuki's and Chaddha's systems are completely devoid of any teaching relating to the need or desire to arrange a plurality of bitstreams representing dimensions into which video image sequence components may be encoded as a partial order.

Therefore, as discussed above, the Applicants submit that, and at least for the reasons presented above, amended independent claim 1 fully satisfies the requirements of 35 U.S.C. §103 and is patentable thereunder.

Dependent claims 8 and 9 depend from claim 1, and recite additional features therefore. As such, and for at least same reasons set forth above, the Applicants submit that claims 8 and 9 are not made obvious by the teachings of Suzuki in view of Chaddha. Therefore, the Applicants submit that dependent claims 8 and 9 also fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder.

PAGE 18/23 * RCVD AT 7/25/2005 8:04:17 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/26 * DNIS:2738300 * CSID:732 530 9808 * DURATION (mm-ss):08-12

C. Claim 27

The Examiner rejected claim 27 under 35 U.S.C. §103(a) as being unpatentable over Suzuki in view the Burt patent (U.S. Patent No. 5,063,603, issued November 5, 1991, hereinafter "Burt"). In response, the Applicants have amended independent claim 25, from which claim 27 depends, to more clearly recite aspects of the invention.

Suzuki has been discussed above.

Burt teaches a method for object recognition, *e.g.*, for recognizing or locating an individual within a series of video frames. For example, a time series of successive, relatively high-resolution image frames, is examined in order to recognize the identity of a specific individual or object in the time series. The frames may then be examined at various resolutions to detect whether any earlier occurring frames include a group of attributes or image features possessed by an image of the specific individual or object. The locations of detected image features are then stored and used in subsequent higher-resolution frames to direct examination only to the image region of the detected features, *e.g.*, in order to verify the detection of the image features and/or to detect additional features or attributes of the image of the specific individual or object. Locations of stationary objects may also be stored in order to distinguish moving objects or images. By repeating this process for successive frames, the accumulated detected features can be used to recognize the detected image region as an image of the specific individual or object.

The Examiner's attention is directed to the fact that Suzuki and Burt (either singly or in any permissible combination) fail to disclose or suggest the novel invention of encoding each component of a video image sequence in accordance with a plurality of dimensions to form a plurality of bitstreams, such that the plurality of bitstreams forms a partial order having a common bitstream as its base, as positively claimed by the Applicants.

As discussed above, Applicants' invention teaches an apparatus for producing deconstructed video that is capable of encoding each component of a video image sequence in accordance with a plurality of selected dimensions to form a plurality of

PAGE 19/23 * RCVD AT 7/25/2005 8:04:17 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/26 * DNIS:2738300 * CSID:732 530 9808 * DURATION (mm-ss):08-12

bitstreams, such that the plurality of bitstreams forms a partial order wherein each point of the partial order represents a unique valid combination of components and dimensions for encoding the video image sequence, and a base of the partial order represents a base bitstream comprising components that are common to each of the plurality of bitstreams. This allows, for example, a user device to select different dimensions and different corresponding dimensional qualities for each deconstructed component of the original video image sequence (*e.g.*, by selecting a given point in the partial order), such that the reconstructed video image sequence comprises the best quality video image sequence that may be processed by the user device in accordance with the user's preferences. Both Suzuki's and Burt's systems are completely devoid of any teaching relating to the need or desire to arrange a plurality of bitstreams representing dimensions into which video image sequence components may be encoded as a partial order.

Dependent claim 27 depends from claim 25, and recites additional features thereof. As such and for at least the same reasons set forth above, the Applicants submit that claim 27 is also not made obvious by the teachings of Suzuki in view of Burt. Therefore, the Applicants submit that claim 27 also fully satisfies the requirements of 35 U.S.C. § 103 and is patentable thereunder.

D. Claim 28

The Examiner rejected claim 28 under 35 U.S.C. §103(a) as being unpatentable over Suzuki in view of the Wine patent (U.S. Patent No. 6,477,201, issued November 5, 2002, hereinafter "Wine"). In response, the Applicants have amended independent claim 25, from which claim 28 depends, as discussed above to more clearly recite aspects of the invention.

Suzuki has been discussed above.

Wine teaches a method for selective enhancement or degradation of information within a video image sequence. For example, regions of particular interest within an image may be encoded with a higher resolution than regions of less significance, in order to emphasize the regions of interest. Thus, a single video image sequence is

PAGE 20/23 * RCVD AT 7/25/2005 8:04:17 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/26 * DNIS:2738300 * CSID:732 530 9808 * DURATION (mm-ss):08-12

produced in which certain aspects of the image sequence have varying characteristic qualities. This is in contrast to a system which produces a plurality of quality-varying versions of the same video image sequence, wherein the quality is substantially uniform within a particular image sequence.

Again, the gap left by Suzuki is not bridged by Wine. Namely, Wine also does not teach encoding each component of a video image sequence in accordance with a plurality of dimensions to form a plurality of bitstreams, such that the plurality of bitstreams forms a partial order having a common bitstream as its base. Thus, for at least for the reasons presented above, independent claim 25 is not made obvious by the teachings of Suzuki in view of Wine.

Dependent claim 28 depends from claim 25 and recites additional features therefor. As such and for at least the same reasons set forth above, the Applicants submit that claim 28 is also not made obvious by the teachings of Suzuki in view of Wine. Therefore, the Applicants submit that claim 28 also fully satisfies the requirements of 35 U.S.C. § 103 and is patentable thereunder.

E. Claims 32-38, 40 and 43-45

The Examiner has rejected claims 32-38, 40 and 43-45 under 35 U.S.C. §103(a) as being unpatentable over Suzuki in view of the Haskell patent (US patent 6,233,356, issued on May 15, 2001, hereinafter Haskell). In response, the Applicants have amended independent claim 32, from which claims 33-38, 40 and 43-45 depend, to more clearly recite aspects of the present invention.

Suzuki has been discussed above.

Haskell teaches a video coding system that produces a single embedded data stream containing several video object layers. In particular, Haskell teaches that an original video sequence is encoded into a data stream comprising a first or "base" layer containing coded video object data of a lowest quality (*e.g.*, temporal or spatial quality), and one or more "enhancement" layers containing enhancement data that, when combined with the base layer video, display increasingly higher-quality video sequences. These multiple video object layers are then organized into a single data

PAGE 21/23 * RCVD AT 7/25/2005 8:04:17 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/26 * DNIS:2738300 * CSID:732 530 9808 * DURATION (mm-ss):08-12

stream by a multiplexer, and the data stream is sent to a decoder for display (*see*, Haskell, column 4, lines 37-39: "The MUX 600 organizes the coded video object data ... into a data stream ..."). The decoder extracts one or more of the video object data layers to display, in accordance with the decoder's own operating parameters. However, Haskell does not teach that coded video object layers are output to the decoder as a plurality of data streams.

The Examiner's attention is directed to the fact that Haskell, like Suzuki, fails to disclose or suggest the novel invention of encoding each component of a video image sequence in accordance with a plurality of dimensions to form a plurality of bitstreams, such that the plurality of bitstreams forms a partial order having a common bitstream as its base, as claimed in Applicants' amended independent claim 32. Specifically, Applicants' claim 32, as amended, positively recites:

> 32. A computer readable medium containing software that, when executed by one or more general purpose computers operating as network nodes, causes the computer or computers to perform a method comprising:
>
> separating a video image sequence into two or more components;
>
> selecting a plurality of dimensions, where each dimension represents a characteristic of the video image sequence; and
>
> encoding each component of the video image sequence in accordance with the selected dimensions to form a plurality of bitstreams, such that the plurality of bitstreams forms a partial order wherein each point of the partial order represents a unique valid combination of components and dimensions for encoding the video image sequence, and a base of the partial order represents a base bitstream comprising components that are common to each of said plurality of bitstreams. (Emphasis added)

As discussed above, Applicants' invention positively claims the step of encoding each component of a video image sequence in accordance with a plurality of selected dimensions to form a plurality of bitstreams, such that the plurality of bitstreams forms a partial order wherein each point of the partial order represents a unique valid combination of components and dimensions for encoding the video image sequence, and a base of the partial order represents a base bitstream comprising components that are common to each of the plurality of bitstreams. Haskell's system is completely devoid of any teaching relating to the need or desire to arrange a plurality of bitstreams

PAGE 22/23 * RCVD AT 7/25/2005 8:04:17 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/26 * DNIS:2738300 * CSID:732 530 9808 * DURATION (mm-ss):08-12

representing dimensions into which video image sequence components may be encoded as a partial order.

Haskell thus does not bridge the gap in the teachings of Suzuki. Therefore, the Applicants submit that, at least for the reasons presented above, independent claim 32, as amended, fully satisfies the requirements of 35 U.S.C. §103 and is patentable thereunder.

Dependent claims 33-38, 40 and 43-45 depend from claim 32 and recite additional features therefor. As such, and for at least the same reasons set forth above, the Applicants submit that claims 33-38, 40 and 43-45 are not made obvious by the teachings of Suzuki in view of Haskell. Therefore, the Applicants submit that dependent claims 33-38, 40 and 43-45 also fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder.

II. CONCLUSION

Thus, the Applicants submit that all of the presented claims now fully satisfy the requirements of 35 U.S.C. §103. Consequently, the Applicants believe that all of these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring the issuance of a final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

7/25/05
Date

Kin-Wah Tong, Attorney
Reg. No. 39,400
(732) 530-9404

Moser, Patterson & Sheridan, LLP
595 Shrewsbury Avenue
Shrewsbury, New Jersey 07702

PAGE 23/23 * RCVD AT 7/25/2005 8:04:17 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/26 * DNIS:2738300 * CSID:732 530 9808 * DURATION (mm-ss):08-12